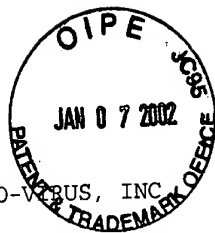


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SEQUENCE LISTING

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<120> ONCOLYTIC VIRUS  
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<141> 2000-09-18  
<150> 09/397,873  
<151> 1999-09-17  
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1 5 10  
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1 5 10

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<400> 6  
Cys Trp Asp His His Asn His His Cys  
1 5

<210> 7  
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<210> 8  
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<210> 9  
<211> 1269  
<212> DNA  
<213> Vesicular stomatitis virus

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tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180  
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt aaaggacatc 240  
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acaatcggaa tatttgacct tgtatccttg aaagccctgg acggcgctact tccagatgga 360  
gtatcggatg cttccagaac cagcgcagat gacaaatggg tgcctttgta tctacttggc 420  
ttatacagag tgggcagAAC acaaatgcct gaatacagaa aaaagctcat ggatgggctg 480  
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tctacagaag atgtaacgac ctggatcttg aaccgagaag ttgcagatga aatgggtcaa 780  
atgatgcttc caggccaaga aattgacaag gccgattcat acatgcctta tttgatcgac 840  
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gacattgagt atacatctct tactacagca ggtttgttgt acgcttatgc agtaggatcc 1020  
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tggtttgaag atcaaaacag aaaaccgact cctgatatga tgcagtatgc gaaaagagca 1200  
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gacaaatga 1269

<210> 10  
<211> 1269  
<212> DNA  
<213> Vesicular stomatitis virus

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tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180  
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt gaaggacatc 240  
cggggtaagt tggataaaga ttggtcaagt ttcggaataa acatcgggaa ggcaggggat 300

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acaatcggaa tatttgacct tgtatccttg aaagccctgg acggtgtact tccagatgga 360
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ttatacagag tgggcagAAC acaaatgcct gaatacagaa aaaggctcat ggatgggctg 480
acaaatcaat gcaaaatgat caatgaacag tttgaacctc ttgtgccaga aggtcgtgac 540
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tggtttgaag atcaaaacag aaaaccgact cctgatatga tgcagtatgc gaaacgagca 1200
gtcatgtcac tgcaaggcct aagagagaag acaattggca agtatgctaa gtcagaattt 1260
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<210> 11

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

<400> 11

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tacctcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt gaaggacatc 240
cggggtaagt tggataaaga ttggtaagtc ttcggaataa acatcgggaa ggcaggggat 300
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gtatcggatg cttccagaac cagcgcagat gacaaatggg tgcctttgta tctacttggc 420
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acaaatcaat gcaaaatgat caatgaacag tttgaacctc ttgtgccaga aggtcgtgac 540
atTTTTgatg tgtggggaaa tgacagtaat tacacaaaaa ttgtcgctgc agtggacatg 600
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tggtttgaag atcaaaacag aaaaccgact cctgatatga tgcagtatgc gaaacgagca 1200
gtcatgtcac tgcaaggcct aagagagaag acaattggca agtatgctaa gtcagaattt 1260
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<210> 12

<211> 1269

<212> DNA

<213> Vesicular stomatitis virus

<400> 12

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aatgaggatc cagtggaaata cccggcagat tacttcagaa aatcaaagga gattcctctt 120

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tacatcaata ctacaaaaag tttgtcagat ctaagaggat atgtctacca aggcctcaaa 180
tccggaaatg tatcaatcat acatgtcaac agctacttgt atggagcatt gaaggacatc 240
cggggtaagt tggataaaga ttggtaagat ttcggaataa acatcgggaa ggcaggggat 300
acaatcggaa tatttgacct tgtatccttg aaagccctgg acggtgtact tccagatgga 360
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gacaaatga 1269

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<210> 13  
 <211> 1029  
 <212> DNA  
 <213> Vesicular stomatitis virus

<220>  
 <221> modified\_base  
 <222> (1)..(1029)  
 <223> "n" represents a, t, c, g, other or unknown

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tttgaccttg tatccttgaa agccctggac ggtgtacttc cagatggagt atcggatgct 180
tccagaacca gcgcagatga caaatggttg cctttgtatc tacttggctt atacagagtg 240
ggcagaacac aaatgcctga atacagaaaa aggctcatgg atgggctgac aaatcaatgc 300
aaaatgatca atgaacagtt tgaacctctt gtgccagaag gtcgtgacat ttttgatgtg 360
tggggaaatg acagtaatta cacaaaaatt gtcgctgcag tggacatggt cttccacatg 420
ttcaaaaaac atgaatgtgc ctggttcaga tacggaaacta ttgtttccag attcaaagat 480
tgtgctgcat tggcaacatt tggacacctc tgcaaaaaa cgggaatgtc tacagaagat 540
gtaacgacct ggatcttgaa ccgagaagtt gcagatgaga tgggtccaaat gatgcttcca 600
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gacattgagt atacatctcn tactacagca ggtttgttgt acgcttatgc agtaggatcc 780
tctgctgact tggcacanca gttttgtgtt ggagatagca aatacactcc agatgatagt 840
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tggtttgaag atcaaaacag aaaaccgact cctgatatga tgcagtatgc gaaacgagca 960
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gacaaatga 1029

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<210> 14  
 <211> 422  
 <212> PRT  
 <213> Vesicular stomatitis virus

<400> 14

Met Ser Val Thr Val Lys Arg Ile Ile Asp Asn Thr Val Ile Val Pro  
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Lys Leu Pro Ala Asn Glu Asp Pro Val Glu Tyr Pro Ala Asp Tyr Phe  
20 25 30

Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu  
35 40 45

Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val  
50 55 60

Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile  
65 70 75 80

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly  
85 90 95

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala  
100 105 110

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser  
115 120 125

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val  
130 135 140

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Lys Leu Met Asp Gly Leu  
145 150 155 160

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro  
165 170 175

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr  
180 185 190

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His  
195 200 205

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp  
210 215 220

Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met  
225 230 235 240

Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp  
245 250 255

Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp  
260 265 270

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro  
275 280 285

Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr



290                      295                      300

Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp  
305                      310                      315                      320

Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr  
                    325                      330                      335

Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp  
                    340                      345                      350

Asn Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala  
                    355                      360                      365

Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp  
                    370                      375                      380

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala  
385                      390                      395                      400

Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala  
                    405                      410                      415

Lys Ser Glu Phe Asp Lys  
                    420

<210> 15  
<211> 422  
<212> PRT  
<213> Vesicular stomatitis virus

<400> 15  
Met Ser Val Thr Val Lys Arg Ile Ile Ala Asn Thr Val Ile Val Pro  
1                      5                      10                      15

Lys Leu Pro Ala Asn Glu Asp Pro Val Glu Tyr Pro Ala Asp Tyr Phe  
                    20                      25                      30

Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu  
                    35                      40                      45

Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val  
50                      55                      60

Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile  
65                      70                      75                      80

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly  
                    85                      90                      95

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala  
                    100                      105                      110

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser  
115                      120                      125

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val  
 130 135 140

Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu  
 145 150 155 160

Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro  
 165 170 175

Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr  
 180 185 190

Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His  
 195 200 205

Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp  
 210 215 220

Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met  
 225 230 235 240

Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp  
 245 250 255

Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp  
 260 265 270

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro  
 275 280 285

Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr  
 290 295 300

Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp  
 305 310 315 320

Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr  
 325 330 335

Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp  
 340 345 350

Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala  
 355 360 365

Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp  
 370 375 380

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala  
 385 390 395 400

Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala  
 405 410 415

Lys Ser Glu Phe Asp Lys  
 420



<210> 16  
<211> 422  
<212> PRT  
<213> Vesicular stomatitis virus

<400> 16

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20 25 30  
Arg Lys Ser Lys Glu Ile Pro Leu Tyr Ile Asn Thr Thr Lys Ser Leu  
35 40 45  
Ser Asp Leu Arg Gly Tyr Val Tyr Gln Gly Leu Lys Ser Gly Asn Val  
50 55 60  
Ser Ile Ile His Val Asn Ser Tyr Leu Tyr Gly Ala Leu Lys Asp Ile  
65 70 75 80  
Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly  
85 90 95  
Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala  
100 105 110  
Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser  
115 120 125  
Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val  
130 135 140  
Gly Arg Thr Gln Met Pro Glu Tyr Arg Lys Arg Leu Met Asp Gly Leu  
145 150 155 160  
Thr Asn Gln Cys Lys Met Ile Asn Glu Gln Phe Glu Pro Leu Val Pro  
165 170 175  
Glu Gly Arg Asp Ile Phe Asp Val Trp Gly Asn Asp Ser Asn Tyr Thr  
180 185 190  
Lys Ile Val Ala Ala Val Asp Met Phe Phe His Met Phe Lys Lys His  
195 200 205  
Glu Cys Ala Ser Phe Arg Tyr Gly Thr Ile Val Ser Arg Phe Lys Asp  
210 215 220  
Cys Ala Ala Leu Ala Thr Phe Gly His Leu Cys Lys Ile Thr Gly Met  
225 230 235 240  
Ser Thr Glu Asp Val Thr Thr Trp Ile Leu Asn Arg Glu Val Ala Asp  
245 250 255  
Glu Met Val Gln Met Met Leu Pro Gly Gln Glu Ile Asp Lys Ala Asp  
260 265 270

Ser Tyr Met Pro Tyr Leu Ile Asp Phe Gly Leu Ser Ser Lys Ser Pro  
275 280 285

Tyr Ser Ser Val Lys Asn Pro Ala Phe His Phe Trp Gly Gln Leu Thr  
290 295 300

Ala Leu Leu Leu Arg Ser Thr Arg Ala Arg Asn Ala Arg Gln Pro Asp  
305 310 315 320

Asp Ile Glu Tyr Thr Ser Leu Thr Thr Ala Gly Leu Leu Tyr Ala Tyr  
325 330 335

Ala Val Gly Ser Ser Ala Asp Leu Ala Gln Gln Phe Cys Val Gly Asp  
340 345 350

Ser Lys Tyr Thr Pro Asp Asp Ser Thr Gly Gly Leu Thr Thr Asn Ala  
355 360 365

Pro Pro Gln Gly Arg Asp Val Val Glu Trp Leu Gly Trp Phe Glu Asp  
370 375 380

Gln Asn Arg Lys Pro Thr Pro Asp Met Met Gln Tyr Ala Lys Arg Ala  
385 390 395 400

Val Met Ser Leu Gln Gly Leu Arg Glu Lys Thr Ile Gly Lys Tyr Ala  
405 410 415

Lys Ser Glu Phe Asp Lys  
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<210> 17

<211> 342

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD\_RES

<222> (1)..(342)

<223> "Xaa" represents any, other or unknown amino acid

<400> 17

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1 5 10 15

Arg Gly Lys Leu Asp Lys Asp Trp Ser Ser Phe Gly Ile Asn Ile Gly  
20 25 30

Lys Ala Gly Asp Thr Ile Gly Ile Phe Asp Leu Val Ser Leu Lys Ala  
35 40 45

Leu Asp Gly Val Leu Pro Asp Gly Val Ser Asp Ala Ser Arg Thr Ser  
50 55 60

Ala Asp Asp Lys Trp Leu Pro Leu Tyr Leu Leu Gly Leu Tyr Arg Val  
65 70 75 80



<400> 18

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caagaggatg gagtgggaaga gcatactaag ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaagggt tgtatgcaca ggatccagaa 240
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ttggatgaat tgttctcatc tagaggagag ttcatctctg tcggaggtga cggacgaatg 720
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gtcaaatatt ctctgtag 798
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<210> 19

<211> 798

<212> DNA

<213> Vesicular stomatitis virus

<400> 19

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caagaggacg gagtgggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaagggt tgtatgtacc agatccggaa 240
gctgagcaag ttgaaggctt tatacagggg cctttagatg actatgcgga tgaggacgtg 300
gatgttgat ttacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
accttacggg tgacattgcc agagggttta agtggagagc agaaatccca gtggcttttg 420
acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600
tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660
ttggatgaat tgttctcatc tagaggagaa ttcatctctg tcggaggtta cggacgaatg 720
tctcataaag aggccatcct gctcggctct aggtacaaaa agttgtacaa tcaggcgaga 780
gtcaaatatt ctctgtag 798
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<210> 20

<211> 570

<212> DNA

<213> Vesicular stomatitis virus

<400> 20

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atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60
gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120
caagaggacg gagtgggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180
gacacagaat ctgaaccaga aattgaagac aatcaagggt tgtatgtacc agatccggaa 240
gctgagcaag ttgaaggctt tatacagggg cctttagatg actatgcgga tgaggacgtg 300
gatgttgat ttacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaag 360
accttacggg tgacattgcc agagggttta agtggagagc agaaatccca gtggcttttg 420
acgattaaag cagtcgttca aagtgccaaa cactggaatc tggcagagtg cacatttgaa 480
gcatcgggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540
actccagtga tgaacacaca tccgtcccaa 570
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<210> 21  
 <211> 798  
 <212> DNA  
 <213> Vesicular stomatitis virus

<400> 21  
 atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60  
 gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120  
 caagaggacg gagtgggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180  
 gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240  
 gctgagcaag ttgaaggcct tatacagggg cctttagatg actatgcgga tgaggacgtg 300  
 gatgttgtat tcaacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaaag 360  
 accttacggg tgacattgcc agaggggttta agtggagagc agaaatccca gtggcttttg 420  
 acgattaaag cagtcgttca aagtgcctaa cactggaatc tggcagagtg cacatttgaa 480  
 gcatcgaggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540  
 actccagtga tgaacacaca tccgtcccaa tcggaagccg tatcagatgt ttggtctctc 600  
 tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660  
 ttggatgaat tgttctcatc tagaggagaa ttcattctctg tcggaggtaa cggacgaatg 720  
 tctcataaag aggccatcct gctcgggtctg aggtacaaaa agttgtacaa tcaggcgaga 780  
 gtcaaatatt ctctgtag 798

<210> 22  
 <211> 798  
 <212> DNA  
 <213> Vesicular stomatitis virus

<400> 22  
 atggataatc tcacaaaagt tcgtgagtat ctcaagtcct attctcgtct agatcaggcg 60  
 gtaggagaga tagatgagat cgaagcacia cgagctgaaa agtccaatta tgagttgttc 120  
 caagaggacg gagtgggaaga gcatactagg ccctcttatt ttcaggcagc agatgattct 180  
 gacacagaat ctgaaccaga aattgaagac aatcaaggct tgtatgtacc agatccggaa 240  
 gctgagcaag ttgaaggcct tatacagggg cctttagatg actatgcgga tgaggacgtg 300  
 gatgttgtat tcaacttcgga ctggaaacag cctgagcttg aatccgacga gcatggaaaag 360  
 accttacggg tgacattgcc agaggggttta agtggagagc agaaatccca gtggcttttg 420  
 acgattaaag cagtcgttca aagtgcctaa cactggaatc tggcagagtg cacatttgaa 480  
 gcatcgaggag aaggggtcat cataaaaaag cgccagataa ctccggatgt atataaggtc 540  
 actccagtga tgaacacaca tccgtcccaa tcagaagccg tatcagatgt ttggtctctc 600  
 tcaaagacat ccatgacttt ccaacccaag aaagcaagtc ttcagcctct caccatatcc 660  
 ttggatgaat tgttctcatc tagaggagaa ttcattctctg tcggaggtaa cggacgaatg 720  
 tctcataaag aggccatcct gctcgggtctg aggtacaaaa agttgtacaa tcaggcgaga 780  
 gtcaaatatt ctctgtag 798

<210> 23  
 <211> 265  
 <212> PRT  
 <213> Vesicular stomatitis virus

<400> 23  
 Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg  
 1 5 10 15  
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala  
 20 25 30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His  
 35 40 45  
 Thr Lys Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser  
 50 55 60  
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Ala Gln Asp Pro Glu  
 65 70 75 80  
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala  
 85 90 95  
 Asp Glu Glu Val Asp Val Val Phe Thr Ser Asp Trp Lys Pro Pro Glu  
 100 105 110  
 Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Ser Pro Glu  
 115 120 125  
 Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Ser Thr Ile Lys Ala  
 130 135 140  
 Val Val Gln Ser Ala Lys Tyr Trp Asn Leu Ala Glu Cys Thr Phe Glu  
 145 150 155 160  
 Ala Ser Gly Glu Gly Val Ile Met Lys Glu Arg Gln Ile Thr Pro Asp  
 165 170 175  
 Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu  
 180 185 190  
 Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln  
 195 200 205  
 Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu  
 210 215 220  
 Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asp Gly Arg Met  
 225 230 235 240  
 Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr  
 245 250 255  
 Asn Gln Ala Arg Val Lys Tyr Ser Leu  
 260 265

<210> 24  
 <211> 265  
 <212> PRT  
 <213> Vesicular stomatitis virus

<400> 24  
 Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg  
 1 5 10 15  
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala  
 20 25 30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His  
 35 40 45  
 Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser  
 50 55 60  
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu  
 65 70 75 80  
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala  
 85 90 95  
 Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu  
 100 105 110  
 Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu  
 115 120 125  
 Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala  
 130 135 140  
 Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu  
 145 150 155 160  
 Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp  
 165 170 175  
 Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu  
 180 185 190  
 Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln  
 195 200 205  
 Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu  
 210 215 220  
 Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met  
 225 230 235 240  
 Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr  
 245 250 255  
 Asn Gln Ala Arg Val Lys Tyr Ser Leu  
 260 265

<210> 25  
 <211> 190  
 <212> PRT  
 <213> Vesicular stomatitis virus

<400> 25  
 Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg  
 1 5 10 15  
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala

20 25 30  
 Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His  
 35 40 45  
 Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser  
 50 55 60  
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu  
 65 70 75 80  
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala  
 85 90 95  
 Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu  
 100 105 110  
 Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu  
 115 120 125  
 Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala  
 130 135 140  
 Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu  
 145 150 155 160  
 Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp  
 165 170 175  
 Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln  
 180 185 190

<210> 26  
 <211> 265  
 <212> PRT  
 <213> Vesicular stomatitis virus

<400> 26  
 Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg  
 1 5 10 15  
 Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala  
 20 25 30  
 Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His  
 35 40 45  
 Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser  
 50 55 60  
 Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu  
 65 70 75 80  
 Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala  
 85 90 95



Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu  
 100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu  
 115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala  
 130 135 140

Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu  
 145 150 155 160

Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp  
 165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu  
 180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln  
 195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu  
 210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met  
 225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr  
 245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu  
 260 265

<210> 27

<211> 265

<212> PRT

<213> Vesicular stomatitis virus

<400> 27

Met Asp Asn Leu Thr Lys Val Arg Glu Tyr Leu Lys Ser Tyr Ser Arg  
 1 5 10 15

Leu Asp Gln Ala Val Gly Glu Ile Asp Glu Ile Glu Ala Gln Arg Ala  
 20 25 30

Glu Lys Ser Asn Tyr Glu Leu Phe Gln Glu Asp Gly Val Glu Glu His  
 35 40 45

Thr Arg Pro Ser Tyr Phe Gln Ala Ala Asp Asp Ser Asp Thr Glu Ser  
 50 55 60

Glu Pro Glu Ile Glu Asp Asn Gln Gly Leu Tyr Val Pro Asp Pro Glu  
 65 70 75 80

Ala Glu Gln Val Glu Gly Phe Ile Gln Gly Pro Leu Asp Asp Tyr Ala  
 85 90 95

Asp Glu Asp Val Asp Val Val Phe Thr Ser Asp Trp Lys Gln Pro Glu  
100 105 110

Leu Glu Ser Asp Glu His Gly Lys Thr Leu Arg Leu Thr Leu Pro Glu  
115 120 125

Gly Leu Ser Gly Glu Gln Lys Ser Gln Trp Leu Leu Thr Ile Lys Ala  
130 135 140

Val Val Gln Ser Ala Lys His Trp Asn Leu Ala Glu Cys Thr Phe Glu  
145 150 155 160

Ala Ser Gly Glu Gly Val Ile Ile Lys Lys Arg Gln Ile Thr Pro Asp  
165 170 175

Val Tyr Lys Val Thr Pro Val Met Asn Thr His Pro Ser Gln Ser Glu  
180 185 190

Ala Val Ser Asp Val Trp Ser Leu Ser Lys Thr Ser Met Thr Phe Gln  
195 200 205

Pro Lys Lys Ala Ser Leu Gln Pro Leu Thr Ile Ser Leu Asp Glu Leu  
210 215 220

Phe Ser Ser Arg Gly Glu Phe Ile Ser Val Gly Gly Asn Gly Arg Met  
225 230 235 240

Ser His Lys Glu Ala Ile Leu Leu Gly Leu Arg Tyr Lys Lys Leu Tyr  
245 250 255

Asn Gln Ala Arg Val Lys Tyr Ser Leu  
260 265

<210> 28

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 28

atgagttcct taaagaagat tctcggctctg aaggggaaag gtaagaaatc taagaaatta 60  
gggatcgcac cacccttga tgaagaggac actagcatgg agtatgctcc gagcgctcca 120  
attgacaaat cctatttttg agttgacgag atggacacct atgatccgaa tcaattaaga 180  
tatgagaaat tcttctttac agtgaaaatg acgggttagat ctaatcgctcc gttcagaaca 240  
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300  
aaacgtccct tctacaaaat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360  
gcggtattgg cagatcaagg tcaaccagag tatcacactc actgcgaagg cagggcttat 420  
ttgccacata ggatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480  
ccattcaata taggtcttta caagggaacg attgagctca caatgacct ctacgatgat 540  
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600  
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcgtgg 660  
gtcctggatt ctatcagcca cttcaaata 690

<210> 29

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 29

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atgagttcct taaagaagat tctcggctctg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgcac cacccttcta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acggtttagat ctaatcgctc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcttgg 660
gtcctggatt ctgtcagcca cttcaaatga 690
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<210> 30

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 30

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atgagttcct taaagaagat tctcggctctg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgcac cacccttcta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag agggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acggtttagat ctaatcgctc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcttgg 660
gtcctggatt ctgtcagcca cttcaaatga 690
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<210> 31

<211> 690

<212> DNA

<213> Vesicular stomatitis virus

<400> 31

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atgagttcct taaagaagat tctcggctctg aaggggaaag gtaagaaatc taagaaatta 60
gggatcgcac cacccttcta tgaagaggac actaacatgg agtatgctcc gagcgctcca 120
attgacaaat cctatttttg agttgacgag atggacactc atgatccgca tcaattaaga 180
tatgagaaat tcttctttac agtgaaaatg acggtttagat ctaatcgctc gttcagaaca 240
tactcagatg tggcagccgc tgtatcccat tgggatcaca tgtacatcgg aatggcaggg 300
aaacgtccct tctacaagat cttggctttt ttgggttctt ctaatctaaa ggccactcca 360
gcggtatttg cagatcaagg tcaaccagag tatcacgctc actgtgaagg cagggcttat 420
ttgccacaca gaatggggaa gaccctccc atgctcaatg taccagagca cttcagaaga 480
ccattcaata taggtcttta caagggaacg gttgagctca caatgaccat ctacgatgat 540
gagtcactgg aagcagctcc tatgatctgg gatcatttca attcttccaa attttctgat 600
ttcagagaga aggccttaat gtttggcctg attgtcgaga aaaaggcatc tggagcttgg 660
gtcctggatt ctgtcagcca cttcaaatga 690
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<210> 32  
<211> 229  
<212> PRT  
<213> Vesicular stomatitis virus

<400> 32  
Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys  
1 5 10 15  
Ser Lys Lys Leu Gly Ile Ala Pro Pro Tyr Glu Glu Asp Thr Ser  
20 25 30  
Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val  
35 40 45  
Asp Glu Met Asp Thr Tyr Asp Pro Asn Gln Leu Arg Tyr Glu Lys Phe  
50 55 60  
Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr  
65 70 75 80  
Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile  
85 90 95  
Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly  
100 105 110  
Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln  
115 120 125  
Pro Glu Tyr His Thr His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg  
130 135 140  
Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg  
145 150 155 160  
Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Ile Glu Leu Thr Met Thr  
165 170 175  
Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His  
180 185 190  
Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe  
195 200 205  
Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser  
210 215 220  
Ile Ser His Phe Lys  
225

<210> 33  
<211> 229  
<212> PRT  
<213> Vesicular stomatitis virus

<400> 33

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys  
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn  
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val  
35 40 45

Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe  
50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr  
65 70 75 80

Tyr Ser Asp Val Ala Ala Ala Val Ser His Trp Asp His Met Tyr Ile  
85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly  
100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln  
115 120 125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg  
130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg  
145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr  
165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His  
180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe  
195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser  
210 215 220

Val Ser His Phe Lys  
225

<210> 34

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 34

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys  
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn  
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val  
35 40 45

Asp Glu Met Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe  
50 55 60

Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr  
65 70 75 80

Tyr Ser Asp Val Ala Ala Val Ser His Trp Asp His Met Tyr Ile  
85 90 95

Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly  
100 105 110

Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln  
115 120 125

Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg  
130 135 140

Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg  
145 150 155 160

Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr  
165 170 175

Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His  
180 185 190

Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe  
195 200 205

Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser  
210 215 220

Val Ser His Phe Lys  
225

<210> 35

<211> 229

<212> PRT

<213> Vesicular stomatitis virus

<400> 35

Met Ser Ser Leu Lys Lys Ile Leu Gly Leu Lys Gly Lys Gly Lys Lys  
1 5 10 15

Ser Lys Lys Leu Gly Ile Ala Pro Pro Pro Tyr Glu Glu Asp Thr Asn  
20 25 30

Met Glu Tyr Ala Pro Ser Ala Pro Ile Asp Lys Ser Tyr Phe Gly Val  
35 40 45

Asp Glu Arg Asp Thr His Asp Pro His Gln Leu Arg Tyr Glu Lys Phe  
 50 55 60  
 Phe Phe Thr Val Lys Met Thr Val Arg Ser Asn Arg Pro Phe Arg Thr  
 65 70 75 80  
 Tyr Ser Asp Val Ala Ala Val Ser His Trp Asp His Met Tyr Ile  
 85 90 95  
 Gly Met Ala Gly Lys Arg Pro Phe Tyr Lys Ile Leu Ala Phe Leu Gly  
 100 105 110  
 Ser Ser Asn Leu Lys Ala Thr Pro Ala Val Leu Ala Asp Gln Gly Gln  
 115 120 125  
 Pro Glu Tyr His Ala His Cys Glu Gly Arg Ala Tyr Leu Pro His Arg  
 130 135 140  
 Met Gly Lys Thr Pro Pro Met Leu Asn Val Pro Glu His Phe Arg Arg  
 145 150 155 160  
 Pro Phe Asn Ile Gly Leu Tyr Lys Gly Thr Val Glu Leu Thr Met Thr  
 165 170 175  
 Ile Tyr Asp Asp Glu Ser Leu Glu Ala Ala Pro Met Ile Trp Asp His  
 180 185 190  
 Phe Asn Ser Ser Lys Phe Ser Asp Phe Arg Glu Lys Ala Leu Met Phe  
 195 200 205  
 Gly Leu Ile Val Glu Lys Lys Ala Ser Gly Ala Trp Val Leu Asp Ser  
 210 215 220  
 Val Ser His Phe Lys  
 225

<210> 36  
 <211> 1536  
 <212> DNA  
 <213> Vesicular stomatitis virus

<400> 36  
 atgaagtgcc ttttgtactt agccttttta ttcattgggg tgaattgcaa gttcaccata 60  
 gtttttccac acaacccaaa aggaaactgg aaaaatgttc cttctaatta ccattattgc 120  
 ccgtcaagct cagatttaaa ttggcataat gacttaatag gcacagccat acaagtcaaa 180  
 atgcccaga gtcacaaggc tattcaagca gacggttgga tgtgtcatgc ttccaaatgg 240  
 gtcactactt gtgatttccg ctggtatgga ccgaagtata taacacagtc catccgatcc 300  
 ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360  
 ctgaatccag gcttccctcc tcaaagttgt ggatattgcaa ctgtgacgga tgccgaagca 420  
 gtgattgtcc aggtgactcc tcaccatgtg ctggttgatg aatacacagg agaatgggtt 480  
 gattcacagt tcatcaacgg aaaatgcagc aattacatat gccccactgt ccataactct 540  
 acaacctggc attctgacta taagggtcaaa gggctatgtg attctaactt catttccatg 600  
 gacatcacct tcttctcaga ggacggagag ctatcatccc tgggaaagga gggcacaggg 660  
 ttcagaagta actactttgc ttatgaaact ggaggcaagg cctgcaaaat gcaatactgc 720  
 aagcattggg gagtcagact cccatcaggt gtctgggtcg agatgggtga taaggatctc 780

```

tttgctgcag ccagattccc tgaatgccca gaaggggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct aattcaggac gttgagagga tcttgagatta ttccctctgc 900
caagaaacct ggagcaaaat cagagcgggt cttccaatct ctccagtggg tctcagctat 960
cttgctccta aaaaccagg aaccggctct gctttcacca taatcaatgg taccctaaaa 1020
tactttgaga ccagatacat cagagtcgat attgctgctc caatcctctc aagaatgggc 1080
ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc accatatgaa 1140
gacgtggaaa ttggacccaa tggagtcttg aggaccagtt caggatataa gtttccttta 1200
tacetgattg gacatgggat gttggactcc gatcttcac ttagctcaaa ggctcaggtg 1260
ttcgaacatc ctcacattca agacgctgct tgcgaacttc ctgatgatga gagtttattt 1320
tttggtgata ctgggctatc caaaaatcca atcgagcttg tagaagggtg gttcagtagt 1380
tggaaggct ctattgcctc tttttcttt atcatagggt taatcattgg actattcttg 1440
gttctccgag ttggtatcca tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500
tatacagaca tagagatgaa ccgacttgga aagtaa 1536

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```

<210> 37
<211> 885
<212> DNA
<213> Vesicular stomatitis virus

```

```

<220>
<221> modified_base
<222> (1)..(885)
<223> "n" represents a, t, c, g, other or unknown

```

```

<400> 37
atgaagtgcc ttttgkactt agctttttta ttcacgagg tgaattgcaa gttcaccata 60
gtttttccat acaaccaaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120
ccgtcaagct cagatttaaa ttgncataat gacttaatag gcacagcctt acaagtcaaa 180
atgcccaaga gtcacaaggc tattcaagca gacggttgga tgtgtcatgc ttccaaatgg 240
gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300
ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360
ctgaatccag gcttccctcc tcaaagtgtg ggatatgcaa ctgtgacgga tgctgaagca 420
gcgattgtcc aggtgactcc tcacatgtg cttgttgatg aatacacagg agaatgggtt 480
gattcacagt tcatcaacgg aaaatgcagc aatgacatg gccccactgt ccataactcc 540
acaacctggc attccgacta taagggtcaa gggctatgtg attctaacct catttccatg 600
gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660
ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720
aagcgttggg gagtcagact cccatcaggt gtctggttcg agatggctga taaggatctc 780
tttgctgcag ccagattccc tgaatgccca gaaggggtcaa gtatctctgc tccatctcag 840
acctcagtgg atgtaagtct cattcaggac gttgagagga tcttg 885

```

```

<210> 38
<211> 705
<212> DNA
<213> Vesicular stomatitis virus

```

```

<400> 38
ccatctcaga cctcagtggg tgtaagtctc attcaggacg ttgagaggat cttggattat 60
tccctctgcc aagaaacctg gagcaaaatc agagcgggtc ttcccatctc tccagtggat 120
ctcagctatc ttgctcctaa aaaccaggga accggctctg tctttaccat aatcaatgg 180
accctaaaaat actttgagac cagatacatc agagtgcata ttgctgctcc aatcctctca 240
agaatggctg gaatgatcag tggaaactac acagaaaggg aactgtggga tgactgggct 300
ccatatgaag acgtggaaat tggacccaat ggagttctga ggaccagttc aggatataag 360
tttctttat atatgattgg acatggtatg ttggactccg atcttcatct tagctcaaag 420
gctcaggtgt ttgaacatcc tcacattcaa gacgctgctt cgcagcttcc tgatgatgag 480

```



actttatttt ttggtgatac tgggctatcc aaaaatccaa tcgagtttgt agaaggttgg 540  
 ttcagtagtt ggaagagctc tattgcctct tttttcttta tcatagggtt aatcattgga 600  
 ctattcttgg ttctccgagt tggatattat ctttgcatta aattaaagca caccaagaaa 660  
 agacagattt atacagacat agagatgaac cgacttggga agtaa 705

<210> 39  
 <211> 1536  
 <212> DNA  
 <213> Vesicular stomatitis virus

<400> 39  
 atgaagtgcc ttttgtactt agcttttttta ttcacgggg tgaattgcaa gttcaccata 60  
 gtttttccat acaaccgaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120  
 ccgtcaagct cagattttaa ttggcataat gacttaatag gcacagcctt acaagtcaaa 180  
 atgccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240  
 gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300  
 ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360  
 ctgaatccag gcttcctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420  
 gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480  
 gattcacagt tcatcaacgg aaaatgcagc aatgacatat gcccactgt ccataactcc 540  
 acaacctggc attccgacta taaggatcaa gggctatgtg attctaacct catttccatg 600  
 gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660  
 ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720  
 aagcattggg gagtcagact cccatcaggt gtctgggtcg agatggctga taaggatctc 780  
 tttgctgcag ccagattccc tgaatgcccc gaaggggtcaa gtatctctgc tccatctcag 840  
 acctcagtg atgtaagtct cattcaggac gttgagagga tcttgatta ttccctctgc 900  
 caagaaacct ggagcaaaat cagagcgggt cttcccatct ctccagtgga tctcagctat 960  
 cttgtccta aaaaccaggg aaccggctct gctttcacca taatcaatgg taccctaaaa 1020  
 tactttgaga ccagatacat cagagtcgat attgtgtct caatcctctc aagaatggtc 1080  
 ggaatgatca gtggaactac cacagaaagg gaactgtggg atgactgggc tccatatgaa 1140  
 gacgtggaaa ttggaccaa tggagttctg aggaccagtt caggatataa gtttccttta 1200  
 tatatgattg gacatggtat gttggactcc gatcttcac ttagctcaaa ggctcaggtg 1260  
 tttgaacatc ctcacattca agacgctght gcgcagcttc ctgatgatga gactttattt 1320  
 tttggtgata ctgggctatc caaaaatcca atcgagtttg tagaagggtg gttcagtagt 1380  
 tggaagagct ctattgcctc ttttttcttt atcatagggt taatcattgg actattcttg 1440  
 gttctccgag ttggtattta tctttgcatt aaattaaagc acaccaagaa aagacagatt 1500  
 tatacacaga tagagatgaa ccgacttggg aagtaa 1536

<210> 40  
 <211> 1399  
 <212> DNA  
 <213> Vesicular stomatitis virus

<400> 40  
 atgaagtgcc ttttgtactt agcttttttta ttcacgggg tgaattgcaa gttcaccata 60  
 gtttttccat acaaccaaaa aggaaactgg aaaaatgttc cttccaatta ccattattgc 120  
 ccgtcaagct cagattttaa ttggcataat gacttaatag gcacagcctt acaggtcaaa 180  
 atgccaaga gtcacaaggc tattcaagca gacggttggg tgtgtcatgc ttccaaatgg 240  
 gtcactactt gtgatttccg ctggtacgga ccgaagtata taacacattc catccgatcc 300  
 ttcactccat ctgtagaaca atgcaaggaa agcattgaac aaacgaaaca aggaacttgg 360  
 ctgaatccag gcttcctcc tcaaagttgt ggatatgcaa ctgtgacgga tgctgaagca 420  
 gcgattgtcc aggtgactcc tcaccatgtg cttgttgatg aatacacagg agaatgggtt 480  
 gattcacagt tcatcaacgg aaaatgcagc aatgacatat gcccactgt ccataactcc 540  
 acaacctggc attccgacta taaggatcaa gggctatgtg attctaacct catttccatg 600  
 gacatcacct tcttctcaga ggacggagag ctatcatccc taggaaagga gggcacaggg 660

ttcagaagta actactttgc ttatgaaact ggagacaagg cctgcaaaat gcagtactgc 720  
 aagcggttggg gagtcagact cccatcaggt gtctgggtcg ggatggctga taaggatctc 780  
 tttgctgcag ccagattccc tgaatgcccga gaagggtcaa gtatctctgc tccatctcag 840  
 acctcagtgg atgtaagtct cattcaggac gttgagagga tcttactttg agaccagata 900  
 catcagagtc gatattgctg ctccaatcct ctcaagaatg gtcggaatga tcagtggaac 960  
 taccacagaa agggaaactgt gggatgactg ggctccatat gaagacgtgg aaattggacc 1020  
 caatggagtt ctgaggacca gttcaggata taagtttcct ttatatatga ttggacatgg 1080  
 tatgttggac tccgatcttc atcttagctc aaaggctcag gtgtttgaac atcctcacat 1140  
 tcaagacgct gcttcgcagc ttcctgatga tgagacttta ttttttgggtg atactgggct 1200  
 atccaaaaat ccaatcgagt ttgtagaagg ttggttcagt agttggaaga gctctattgc 1260  
 ctcttttttc tttatcatag ggttaatcat tggactattc ttgggtctcc gagttggat 1320  
 ttatctttgc attaaattaa agcacaccaa gaaaagacag atttatacag acatagagat 1380  
 gaaccgactt gggaagtaa 1399

<210> 41  
 <211> 511  
 <212> PRT  
 <213> Vesicular stomatitis virus

<400> 41  
 Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys  
 1 5 10 15  
 Lys Phe Thr Ile Val Phe Pro His Asn Gln Lys Gly Asn Trp Lys Asn  
 20 25 30  
 Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp  
 35 40 45  
 His Asn Asp Leu Ile Gly Thr Ala Ile Gln Val Lys Met Pro Lys Ser  
 50 55 60  
 His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp  
 65 70 75 80  
 Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr Gln  
 85 90 95  
 Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile  
 100 105 110  
 Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln  
 115 120 125  
 Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Val Ile Val Gln  
 130 135 140  
 Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val  
 145 150 155 160  
 Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Tyr Ile Cys Pro Thr  
 165 170 175  
 Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu  
 180 185 190

Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp  
 195 200 205  
 Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn  
 210 215 220  
 Tyr Phe Ala Tyr Glu Thr Gly Gly Lys Ala Cys Lys Met Gln Tyr Cys  
 225 230 235 240  
 Lys His Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala  
 245 250 255  
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly  
 260 265 270  
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile  
 275 280 285  
 Gln Asp Val Glu Arg Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp  
 290 295 300  
 Ser Lys Ile Arg Ala Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr  
 305 310 315 320  
 Leu Ala Pro Lys Asn Pro Gly Thr Gly Pro Ala Phe Thr Ile Ile Asn  
 325 330 335  
 Gly Thr Leu Lys Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala  
 340 345 350  
 Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr  
 355 360 365  
 Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile  
 370 375 380  
 Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu  
 385 390 395 400  
 Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser  
 405 410 415  
 Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Ala Ser Gln  
 420 425 430  
 Leu Pro Asp Asp Glu Ser Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys  
 435 440 445  
 Asn Pro Ile Glu Leu Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser  
 450 455 460  
 Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu  
 465 470 475 480  
 Val Leu Arg Val Gly Ile His Leu Cys Ile Lys Leu Lys His Thr Lys  
 485 490 495

Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys  
500 505 510

<210> 42  
<211> 295  
<212> PRT  
<213> Vesicular stomatitis virus

<220>  
<221> MOD\_RES  
<222> (1)..(295)  
<223> "Xaa" represents any, other or unknown amino acid

<400> 42  
Met Lys Cys Leu Leu Xaa Leu Ala Phe Leu Phe Ile Gly Val Asn Cys  
1 5 10 15  
Lys Phe Thr Ile Val Phe Pro Tyr Asn Gln Lys Gly Asn Trp Lys Asn  
20 25 30  
Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Xaa  
35 40 45  
His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser  
50 55 60  
His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp  
65 70 75 80  
Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His  
85 90 95  
Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile  
100 105 110  
Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln  
115 120 125  
Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln  
130 135 140  
Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val  
145 150 155 160  
Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr  
165 170 175  
Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu  
180 185 190  
Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp  
195 200 205  
Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn  
210 215 220

Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys  
225 230 235 240

Lys Arg Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala  
245 250 255

Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly  
260 265 270

Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile  
275 280 285

Gln Asp Val Glu Arg Ile Leu  
290 295

<210> 43

<211> 234

<212> PRT

<213> Vesicular stomatitis virus

<400> 43

Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile Gln Asp Val Glu Arg  
1 5 10 15

Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp Ser Lys Ile Arg Ala  
20 25 30

Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr Leu Ala Pro Lys Asn  
35 40 45

Pro Gly Thr Gly Pro Val Phe Thr Ile Ile Asn Gly Thr Leu Lys Tyr  
50 55 60

Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala Ala Pro Ile Leu Ser  
65 70 75 80

Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr Glu Arg Glu Leu Trp  
85 90 95

Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile Gly Pro Asn Gly Val  
100 105 110

Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu Tyr Met Ile Gly His  
115 120 125

Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser Lys Ala Gln Val Phe  
130 135 140

Glu His Pro His Ile Gln Asp Ala Ala Ser Gln Leu Pro Asp Asp Glu  
145 150 155 160

Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys Asn Pro Ile Glu Phe  
165 170 175

Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser Ile Ala Ser Phe Phe  
180 185 190

Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu Val Leu Arg Val Gly  
195 200 205

Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys Lys Arg Gln Ile Tyr  
210 215 220

Thr Asp Ile Glu Met Asn Arg Leu Gly Lys  
225 230

<210> 44

<211> 511

<212> PRT

<213> Vesicular stomatitis virus

<220>

<221> MOD\_RES

<222> (1)..(511)

<223> "Xaa" represents any, other or unknown amino acid

<400> 44

Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys  
1 5 10 15

Lys Phe Thr Ile Val Phe Pro Tyr Asn Arg Lys Gly Asn Trp Lys Asn  
20 25 30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp  
35 40 45

His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser  
50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp  
65 70 75 80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His  
85 90 95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile  
100 105 110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln  
115 120 125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln  
130 135 140

Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val  
145 150 155 160

Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr  
165 170 175

Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu  
180 185 190

Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp  
 195 200 205  
 Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn  
 210 215 220  
 Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys  
 225 230 235 240  
 Lys His Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Met Ala  
 245 250 255  
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly  
 260 265 270  
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile  
 275 280 285  
 Gln Asp Val Glu Arg Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp  
 290 295 300  
 Ser Lys Ile Arg Ala Gly Leu Pro Ile Ser Pro Val Asp Leu Ser Tyr  
 305 310 315 320  
 Leu Ala Pro Lys Asn Pro Gly Thr Gly Pro Ala Phe Thr Ile Ile Asn  
 325 330 335  
 Gly Thr Leu Lys Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp Ile Ala  
 340 345 350  
 Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr Thr Thr  
 355 360 365  
 Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val Glu Ile  
 370 375 380  
 Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe Pro Leu  
 385 390 395 400  
 Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu Ser Ser  
 405 410 415  
 Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Xaa Ala Gln  
 420 425 430  
 Leu Pro Asp Asp Glu Thr Leu Phe Phe Gly Asp Thr Gly Leu Ser Lys  
 435 440 445  
 Asn Pro Ile Glu Phe Val Glu Gly Trp Phe Ser Ser Trp Lys Ser Ser  
 450 455 460  
 Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu Phe Leu  
 465 470 475 480  
 Val Leu Arg Val Gly Ile Tyr Leu Cys Ile Lys Leu Lys His Thr Lys  
 485 490 495

Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys  
500 505 510

<210> 45  
<211> 465  
<212> PRT  
<213> Vesicular stomatitis virus

<400> 45  
Met Lys Cys Leu Leu Tyr Leu Ala Phe Leu Phe Ile Gly Val Asn Cys  
1 5 10 15

Lys Phe Thr Ile Val Phe Pro Tyr Asn Gln Lys Gly Asn Trp Lys Asn  
20 25 30

Val Pro Ser Asn Tyr His Tyr Cys Pro Ser Ser Ser Asp Leu Asn Trp  
35 40 45

His Asn Asp Leu Ile Gly Thr Ala Leu Gln Val Lys Met Pro Lys Ser  
50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ser Lys Trp  
65 70 75 80

Val Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His  
85 90 95

Ser Ile Arg Ser Phe Thr Pro Ser Val Glu Gln Cys Lys Glu Ser Ile  
100 105 110

Glu Gln Thr Lys Gln Gly Thr Trp Leu Asn Pro Gly Phe Pro Pro Gln  
115 120 125

Ser Cys Gly Tyr Ala Thr Val Thr Asp Ala Glu Ala Ala Ile Val Gln  
130 135 140

Val Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Val  
145 150 155 160

Asp Ser Gln Phe Ile Asn Gly Lys Cys Ser Asn Asp Ile Cys Pro Thr  
165 170 175

Val His Asn Ser Thr Thr Trp His Ser Asp Tyr Lys Val Lys Gly Leu  
180 185 190

Cys Asp Ser Asn Leu Ile Ser Met Asp Ile Thr Phe Phe Ser Glu Asp  
195 200 205

Gly Glu Leu Ser Ser Leu Gly Lys Glu Gly Thr Gly Phe Arg Ser Asn  
210 215 220

Tyr Phe Ala Tyr Glu Thr Gly Asp Lys Ala Cys Lys Met Gln Tyr Cys  
225 230 235 240

Lys Arg Trp Gly Val Arg Leu Pro Ser Gly Val Trp Phe Gly Met Ala



245                      250                      255  
 Asp Lys Asp Leu Phe Ala Ala Ala Arg Phe Pro Glu Cys Pro Glu Gly  
                          260                                      265                                      270  
 Ser Ser Ile Ser Ala Pro Ser Gln Thr Ser Val Asp Val Ser Leu Ile  
                          275                                      280                                      285  
 Gln Asp Val Glu Arg Ile Tyr Phe Glu Thr Arg Tyr Ile Arg Val Asp  
                          290                                      295                                      300  
 Ile Ala Ala Pro Ile Leu Ser Arg Met Val Gly Met Ile Ser Gly Thr  
                          305                                      310                                      315                                      320  
 Thr Thr Glu Arg Glu Leu Trp Asp Asp Trp Ala Pro Tyr Glu Asp Val  
    325                                      330                                      335  
 Glu Ile Gly Pro Asn Gly Val Leu Arg Thr Ser Ser Gly Tyr Lys Phe  
    340                                      345                                      350  
 Pro Leu Tyr Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Leu  
    355                                      360                                      365  
 Ser Ser Lys Ala Gln Val Phe Glu His Pro His Ile Gln Asp Ala Ala  
    370                                      375                                      380  
 Ser Gln Leu Pro Asp Asp Glu Thr Leu Phe Phe Gly Asp Thr Gly Leu  
    385                                      390                                      395                                      400  
 Ser Lys Asn Pro Ile Glu Phe Val Glu Gly Trp Phe Ser Ser Trp Lys  
    405                                      410                                      415  
 Ser Ser Ile Ala Ser Phe Phe Phe Ile Ile Gly Leu Ile Ile Gly Leu  
    420                                      425                                      430  
 Phe Leu Val Leu Arg Val Gly Ile Tyr Leu Cys Ile Lys Leu Lys His  
    435                                      440                                      445  
 Thr Lys Lys Arg Gln Ile Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly  
    450                                      455                                      460  
 Lys  
 465

<210> 46  
 <211> 6330  
 <212> DNA  
 <213> Vesicular stomatitis virus

<400> 46  
 atggaagtcc acgattttga gaccgacgag ttcaatgatt tcaatgaaga tgactatgcc 60  
 acaagagaat tcctgaatcc cgatgagcgc atgacgtact tgaatcatgc tgattacaat 120  
 ttgaattctc ctctaattag tgatgatatt gacaatttga tcaggaaatt caattctctt 180  
 ccgattccct cgatgtggga tagtaagaac tgggatggag ttcttgagat gttaacatca 240  
 tgtcaagcca atcccatctc aacatctcag atgcataaat ggatgggaag ttggttaatg 300  
 tctgataatc atgatgccag tcaagggtat agttttttac atgaagtgga caaagaggca 360

gaaataacat	ttgacgtggt	ggagaccttc	atccgcggt	ggggcaacaa	accaattgaa	420
tacatcaaaa	aggaaagatg	gactgactca	ttcaaaaatc	tcgcttattt	gtgtcaaaaag	480
tttttgact	tacacaagtt	gacattaatc	ttaaatgctg	tctctgaggt	ggaattgctc	540
aacttggcga	ggactttcaa	aggcaaagtc	agaagaagtt	ctcatggaac	gaacatatgc	600
aggattaggg	ttcccagctt	gggtcctact	tttatttcag	aaggatgggc	ttacttcaag	660
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<211> 5327

<212> DNA

<213> Vesicular stomatitis virus

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<212> DNA
<213> Vesicular stomatitis virus

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<210> 50

<211> 2109

<212> PRT

<213> Vesicular stomatitis virus

<400> 50

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Asp Asp Tyr Ala Thr Arg Glu Phe Leu Asn Pro Asp Glu Arg Met Thr

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Asp	Ile	Asp	Asn	Leu	Ile	Arg	Lys	Phe	Asn	Ser	Leu	Pro	Ile	Pro	Ser
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Met	Trp	Asp	Ser	Lys	Asn	Trp	Asp	Gly	Val	Leu	Glu	Met	Leu	Thr	Ser
	65				70					75					80
Cys	Gln	Ala	Asn	Pro	Ile	Ser	Thr	Ser	Gln	Met	His	Lys	Trp	Met	Gly
			85						90					95	
Ser	Trp	Leu	Met	Ser	Asp	Asn	His	Asp	Ala	Ser	Gln	Gly	Tyr	Ser	Phe
		100						105					110		
Leu	His	Glu	Val	Asp	Lys	Glu	Ala	Glu	Ile	Thr	Phe	Asp	Val	Val	Glu
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Thr	Phe	Ile	Arg	Gly	Trp	Gly	Asn	Lys	Pro	Ile	Glu	Tyr	Ile	Lys	Lys
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Glu	Arg	Trp	Thr	Asp	Ser	Phe	Lys	Ile	Leu	Ala	Tyr	Leu	Cys	Gln	Lys
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Phe	Leu	Asp	Leu	His	Lys	Leu	Thr	Leu	Ile	Leu	Asn	Ala	Val	Ser	Glu
			165					170						175	
Val	Glu	Leu	Leu	Asn	Leu	Ala	Arg	Thr	Phe	Lys	Gly	Lys	Val	Arg	Arg
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Ser	Ser	His	Gly	Thr	Asn	Ile	Cys	Arg	Ile	Arg	Val	Pro	Ser	Leu	Gly
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Pro	Thr	Phe	Ile	Ser	Glu	Gly	Trp	Ala	Tyr	Phe	Lys	Lys	Leu	Asp	Ile
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Leu	Met	Asp	Arg	Asn	Phe	Leu	Leu	Met	Val	Lys	Asp	Val	Ile	Ile	Gly
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Arg	Met	Gln	Thr	Val	Leu	Ser	Met	Val	Cys	Arg	Ile	Asp	Asn	Leu	Phe
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Ser	Glu	Gln	Asp	Ile	Phe	Ser	Leu	Leu	Asn	Ile	Tyr	Arg	Ile	Gly	Asp
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Lys	Ile	Val	Glu	Arg	Gln	Gly	Asn	Phe	Ser	Tyr	Asp	Leu	Ile	Lys	Met
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Val	Glu	Pro	Ile	Cys	Asn	Leu	Lys	Leu	Met	Lys	Leu	Ala	Arg	Glu	Ser
		290				295					300				
Arg	Pro	Leu	Val	Pro	Gln	Phe	Pro	His	Phe	Glu	Asn	His	Ile	Lys	Thr
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Ser	Val	Asp	Glu	Gly	Ala	Lys	Ile	Asp	Arg	Gly	Ile	Arg	Phe	Leu	His





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.	Asp Gln Ile Met Ser Val Lys Thr Val Asp Leu Thr Leu Val Ile Tyr	340	345		350
.	Gly Ser Phe Arg His Trp Gly His Pro Phe Ile Asp Tyr Tyr Thr Gly	355	360		365
	Leu Glu Lys Leu His Ser Gln Val Thr Met Lys Lys Asp Ile Asp Val	370	375		380
	Ser Tyr Ala Lys Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe	385	390		395
	Gln Gln Phe Asn Asp His Lys Lys Trp Phe Val Asn Gly Asp Leu Leu	405	410		415
	Pro His Asp His Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro	420	425		430
	Thr Ala Ala Gln Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro	435	440		445
	Leu Ile Lys Cys Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile	450	455		460
	Tyr Ser Asp Lys Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His	465	470		475
	Val Arg Met Asn Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln	485	490		495
	Thr Met Leu Asp Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu	500	505		510
	Ile Asp Glu Lys Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys	515	520		525
	Gly Lys Glu Arg Glu Leu Lys Leu Ala Gly Arg Phe Phe Ser Leu Met	530	535		540
	Ser Trp Lys Leu Arg Glu Tyr Phe Val Ile Thr Glu Tyr Leu Ile Lys	545	550		555
	Thr His Phe Val Pro Met Phe Lys Gly Leu Thr Met Ala Asp Asp Leu	565	570		575
	Thr Ala Val Ile Lys Lys Met Leu Asp Ser Ser Ser Gly Gln Gly Leu	580	585		590
	Lys Ser Tyr Glu Ala Ile Cys Ile Ala Asn His Ile Asp Tyr Glu Lys	595	600		605
	Trp Asn Asn His Gln Arg Lys Leu Ser Asn Gly Pro Val Phe Arg Val	610	615		620
	Met Gly Gln Phe Leu Gly Tyr Pro Ser Leu Ile Glu Arg Thr His Glu				

625		630		635		640
Phe Phe Glu Lys Ser Leu Ile Tyr Tyr Asn Gly Arg Pro Asp Leu Met						
		645		650		655
Arg Val His Asn Asn Thr Leu Ile Asn Ser Thr Ser Gln Arg Val Cys						
		660		665		670
Trp Gln Gly Gln Glu Gly Gly Leu Glu Gly Leu Arg Gln Lys Gly Trp						
		675		680		685
Thr Ile Leu Asn Leu Leu Val Ile Gln Arg Glu Ala Lys Ile Arg Asn						
		690		695		700
Thr Ala Val Lys Val Leu Ala Gln Gly Asp Asn Gln Val Ile Cys Thr						
		705		710		715
Gln Tyr Lys Thr Lys Lys Ser Arg Asn Val Val Glu Leu Gln Gly Ala						
		725		730		735
Leu Asn Gln Met Val Ser Asn Asn Glu Lys Ile Met Thr Ala Ile Lys						
		740		745		750
Ile Gly Thr Gly Lys Leu Gly Leu Leu Ile Asn Asp Asp Glu Thr Met						
		755		760		765
Gln Ser Ala Asp Tyr Leu Asn Tyr Gly Lys Ile Pro Ile Phe Arg Gly						
		770		775		780
Val Ile Arg Gly Leu Glu Thr Lys Arg Trp Ser Arg Val Thr Cys Val						
		785		790		795
Thr Asn Asp Gln Ile Pro Thr Cys Ala Asn Ile Met Ser Ser Val Ser						
		805		810		815
Thr Asn Ala Leu Thr Val Ala His Phe Ala Glu Asn Pro Ile Asn Ala						
		820		825		830
Met Ile Gln Tyr Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met						
		835		840		845
Met His Asp Pro Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys						
		850		855		860
Ile Pro Gly Leu His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu						
		865		870		875
Asp Pro Ser Ile Gly Gly Val Ser Gly Met Ser Leu Ser Arg Phe Leu						
		885		890		895
Ile Arg Ala Phe Pro Asp Pro Val Thr Glu Ser Leu Ser Phe Trp Arg						
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Phe Ile His Val His Ala Arg Ser Glu His Leu Lys Glu Met Ser Ala						
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Val Phe Gly Asn Pro Glu Ile Ala Lys Phe Arg Ile Thr His Ile Asp						

930                      935                      940  
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 Pro Ala Asn Leu Leu Lys Thr Glu Val Lys Lys Cys Leu Ile Glu Ser  
 965                      970                      975  
 Arg Gln Thr Ile Arg Asn Gln Val Ile Lys Asp Ala Thr Ile Tyr Leu  
 980                      985                      990  
 Tyr His Glu Glu Asp Arg Leu Arg Ser Phe Leu Trp Ser Ile Asn Pro  
 995                      1000                      1005  
 Leu Phe Pro Arg Phe Leu Ser Glu Phe Lys Ser Gly Thr Phe Leu Gly  
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 Arg Ser Glu Val Ser Ser Leu Thr His Leu Gly Lys Leu His Leu Arg  
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 Arg Gly Ser Cys Lys Met Trp Thr Cys Ser Ala Thr His Ala Asp Thr  
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 1090                      1095                      1100  
 His Pro Leu Glu Met Leu Gly Pro Gln His Arg Lys Glu Thr Pro Cys  
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 Ala Pro Cys Asn Thr Ser Gly Phe Asn Tyr Val Ser Val His Cys Pro  
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 Asp Gly Ile His Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr  
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 Leu Gly Ser Lys Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu  
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 Arg Glu Ser Lys Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp  
 1170                      1175                      1180  
 Ala Ile Ser Trp Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile  
 1185                      1190                      1195                      1200  
 Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln  
 1205                      1210                      1215  
 His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser  
 1220                      1225                      1230  
 Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr

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Phe Asp Phe Leu Phe Gln Ala Thr Leu Leu Tyr Ala Gln Ile Thr Thr 1265 1270 1275 1280		
Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His 1285 1290 1295		
Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp 1300 1305 1310		
Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr 1315 1320 1325		
Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr 1330 1335 1340		
Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr 1345 1350 1355 1360		
Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg 1365 1370 1375		
Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln 1380 1385 1390		
Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu 1395 1400 1405		
Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His 1410 1415 1420		
Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile 1425 1430 1435 1440		
Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly 1445 1450 1455		
Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser 1460 1465 1470		
Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe 1475 1480 1485		
Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr 1490 1495 1500		
Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly 1505 1510 1515 1520		
Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe 1525 1530 1535		
Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser		

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Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro 1585 1590 1595 1600		
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Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln 1620 1625 1630		
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Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr 1730 1735 1740		
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<221> MOD\_RES

<222> (1)..(1753)

<223> "Xaa" represents any, other or unknown amino acid

<400> 51

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Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe Gln Gln Phe Asn  
35 40 45

Asp His Xaa Lys Trp Phe Val Asn Gly Asp Leu Leu Pro His Asp His  
50 55 60

Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro Thr Ala Ala Gln  
65 70 75 80

Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro Leu Ile Lys Cys  
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Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile Tyr Ser Asp Lys  
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Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His Val Arg Met Asn  
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Gly Leu Asp Asp Asp Asp Leu Ile Ile Gly Leu Lys Gly Lys Glu Arg  
165 170 175

Glu Leu Lys Leu Ala Gly Arg Phe Phe Ser Leu Met Ser Trp Lys Leu  
180 185 190

Arg Glu Tyr Phe Val Ile Thr Glu Tyr Leu Ile Lys Thr His Phe Val  
195 200 205

Pro Met Phe Lys Gly Leu Thr Met Ala Asp Asp Leu Thr Ala Val Ile  
210 215 220

Lys Lys Met Leu Asp Ser Ser Ser Gly Gln Gly Leu Lys Ser Tyr Glu  
225 230 235 240

Ala Ile Cys Ile Ala Asn His Ile Asp Tyr Glu Lys Trp Asn Asn His  
245 250 255

Gln Arg Lys Leu Ser Asn Gly Pro Val Phe Arg Val Met Gly Gln Phe  
260 265 270

Leu Gly Tyr Pro Ser Leu Ile Glu Arg Thr His Glu Phe Phe Glu Lys

275	280	285
Ser Leu Ile Tyr Tyr Asn Gly Arg Pro Asp Leu Met Arg Val His Asn 290 295 300		
Asn Thr Leu Ile Asn Ser Thr Ser Gln Arg Val Cys Trp Gln Gly Gln 305 310 315 320		
Glu Gly Gly Leu Glu Gly Leu Arg Gln Lys Gly Trp Ser Ile Leu Asn 325 330 335		
Leu Leu Val Ile Gln Arg Glu Ala Lys Ile Arg Asn Thr Ala Val Lys 340 345 350		
Val Leu Ala Gln Gly Asp Asn Gln Val Ile Cys Thr Gln Tyr Lys Thr 355 360 365		
Lys Lys Ser Arg Asn Val Val Glu Leu Gln Gly Ala Leu Asn Gln Met 370 375 380		
Val Ser Asn Asn Glu Lys Ile Met Thr Ala Ile Lys Ile Gly Thr Gly 385 390 395 400		
Lys Leu Gly Leu Leu Ile Asn Asp Asp Glu Thr Met Gln Ser Ala Asp 405 410 415		
Tyr Leu Asn Tyr Gly Lys Ile Pro Ile Phe Arg Gly Val Ile Arg Gly 420 425 430		
Leu Glu Thr Lys Arg Trp Ser Arg Val Thr Cys Val Thr Asn Asp Gln 435 440 445		
Ile Pro Thr Cys Ala Asn Ile Met Ser Ser Val Ser Thr Asn Ala Leu 450 455 460		
Thr Val Ala His Phe Ala Glu Asn Pro Ile Asn Ala Met Ile Gln Tyr 465 470 475 480		
Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met Met His Asp Pro 485 490 495		
Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys Ile Pro Gly Leu 500 505 510		
His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu Asp Pro Ser Ile 515 520 525		
Gly Gly Val Ser Gly Met Ser Leu Ser Arg Phe Leu Ile Arg Ala Phe 530 535 540		
Pro Asp Pro Val Thr Glu Ser Leu Ser Phe Trp Arg Phe Ile His Val 545 550 555 560		
His Ala Arg Ser Glu His Leu Lys Glu Met Ser Ala Val Phe Gly Asn 565 570 575		
Pro Glu Ile Ala Lys Phe Arg Ile Thr His Ile Asp Lys Leu Val Glu		



580	585	590
Asp Pro Thr Ser Leu Asn Ile Ala Met Gly Met Ser Pro Ala Asn Leu		
595	600	605
Leu Lys Thr Glu Val Lys Lys Cys Leu Ile Glu Ser Arg Gln Thr Ile		
610	615	620
Arg Asn Gln Val Ile Lys Asp Ala Thr Ile Tyr Leu Tyr His Glu Glu		
625	630	635 640
Asp Arg Leu Arg Ser Phe Leu Trp Ser Ile Asn Pro Leu Phe Pro Arg		
	645	650 655
Phe Leu Ser Glu Phe Lys Ser Gly Thr Phe Leu Gly Val Ala Asp Gly		
	660	665 670
Leu Ile Ser Leu Phe Gln Asn Ser Arg Thr Ile Arg Asn Ser Phe Lys		
	675	680 685
Lys Lys Tyr His Arg Glu Leu Asp Asp Leu Ile Val Arg Ser Glu Val		
	690	695 700
Ser Ser Leu Thr His Leu Gly Lys Leu His Leu Arg Arg Gly Ser Cys		
705	710	715 720
Lys Met Trp Thr Cys Ser Ala Thr His Ala Asp Thr Leu Arg Tyr Lys		
	725	730 735
Ser Trp Gly Arg Thr Val Ile Gly Thr Thr Val Pro His Pro Leu Glu		
	740	745 750
Met Leu Gly Pro Gln His Arg Lys Glu Thr Pro Cys Ala Pro Cys Asn		
	755	760 765
Thr Ser Gly Phe Asn Tyr Val Ser Val His Cys Pro Asp Gly Ile His		
	770	775 780
Asp Val Phe Ser Ser Arg Gly Pro Leu Pro Ala Tyr Leu Gly Ser Lys		
785	790	795 800
Thr Ser Glu Ser Thr Ser Ile Leu Gln Pro Trp Glu Arg Glu Ser Lys		
	805	810 815
Val Pro Leu Ile Lys Arg Ala Thr Arg Leu Arg Asp Ala Ile Ser Trp		
	820	825 830
Phe Val Glu Pro Asp Ser Lys Leu Ala Met Thr Ile Leu Ser Asn Ile		
	835	840 845
His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln His Gly Phe Lys		
	850	855 860
Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser Arg Met Ser His		
865	870	875 880
Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr Arg Leu Met Ala		

885										890					895				
Thr	Thr	Asp	Thr	Met	Arg	Asp	Leu	Gly	Asp	Gln	Asn	Phe	Asp	Phe	Leu				
			900					905					910						
Phe	Gln	Ala	Thr	Leu	Leu	Tyr	Ala	Gln	Ile	Thr	Thr	Thr	Val	Ala	Arg				
		915					920					925							
Asp	Gly	Trp	Ile	Thr	Ser	Cys	Thr	Asp	His	Tyr	His	Ile	Ala	Cys	Lys				
	930					935					940								
Ser	Cys	Leu	Arg	Pro	Ile	Glu	Glu	Ile	Thr	Leu	Asp	Ser	Ser	Met	Asp				
945					950					955					960				
Tyr	Thr	Pro	Pro	Asp	Val	Ser	His	Val	Leu	Lys	Thr	Trp	Arg	Asn	Gly				
				965					970					975					
Glu	Gly	Ser	Trp	Gly	Gln	Glu	Ile	Lys	Gln	Ile	Tyr	Pro	Leu	Glu	Gly				
			980					985					990						
Asn	Trp	Lys	Asn	Leu	Ala	Pro	Ala	Glu	Gln	Ser	Tyr	Gln	Val	Gly	Arg				
	995					1000						1005							
Cys	Ile	Gly	Phe	Leu	Tyr	Gly	Asp	Leu	Ala	Tyr	Arg	Lys	Ser	Thr	His				
	1010					1015					1020								
Ala	Glu	Asp	Ser	Ser	Leu	Phe	Pro	Leu	Ser	Ile	Gln	Gly	Arg	Ile	Arg				
1025					1030					1035					1040				
Gly	Arg	Gly	Phe	Leu	Lys	Gly	Leu	Leu	Asp	Gly	Leu	Met	Arg	Ala	Ser				
			1045					1050					1055						
Cys	Cys	Gln	Val	Ile	His	Arg	Arg	Ser	Leu	Ala	His	Leu	Lys	Arg	Pro				
		1060						1065				1070							
Ala	Asn	Ala	Val	Tyr	Gly	Gly	Leu	Ile	Tyr	Leu	Ile	Asp	Lys	Leu	Ser				
	1075					1080					1085								
Val	Ser	Pro	Pro	Phe	Leu	Ser	Leu	Thr	Arg	Ser	Gly	Pro	Ile	Arg	Asp				
	1090					1095					1100								
Glu	Leu	Glu	Thr	Ile	Pro	His	Lys	Ile	Pro	Thr	Ser	Tyr	Pro	Thr	Ser				
1105				1110					1115				1120						
Asn	Arg	Asp	Met	Gly	Val	Ile	Val	Arg	Asn	Tyr	Phe	Lys	Tyr	Gln	Cys				
			1125					1130					1135						
Arg	Leu	Ile	Glu	Lys	Gly	Lys	Tyr	Arg	Ser	His	Tyr	Ser	Gln	Leu	Trp				
		1140					1145					1150							
Leu	Phe	Ser	Asp	Val	Leu	Ser	Ile	Asp	Phe	Ile	Gly	Pro	Phe	Ser	Ile				
	1155					1160					1165								
Ser	Thr	Thr	Leu	Leu	Gln	Ile	Leu	Tyr	Lys	Pro	Phe	Leu	Ser	Gly	Lys				
	1170				1175						1180								
Asp	Lys	Asn	Glu	Leu	Arg	Glu	Leu	Ala	Asn	Leu	Ser	Ser	Leu	Leu	Arg				

1185                      1190                      1195                      1200  
 Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe Phe Thr Lys Asp  
                                  1205                      1210                      1215  
 Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys Lys Phe Gly Ile  
                                  1220                      1225                      1230  
 Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro Trp Gly Arg Glu  
                                  1235                      1240                      1245  
 Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr Thr Thr Thr Pro  
                                  1250                      1255                      1260  
 Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln Asn Pro Leu Leu  
                                  1265                      1270                      1275                      1280  
 Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala His Tyr Lys Ile  
                                  1285                      1290                      1295  
 Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg Asp Phe Leu Ser  
                                  1300                      1305                      1310  
 Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu Leu Arg Glu Asn  
                                  1315                      1320                      1325  
 Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu Leu Ser Gly Ser  
                                  1330                      1335                      1340  
 Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala Leu Glu Thr Leu  
                                  1345                      1350                      1355                      1360  
 Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr Cys Trp Glu Tyr  
                                  1365                      1370                      1375  
 Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr Phe Leu Arg Leu  
                                  1380                      1385                      1390  
 Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val Met Asp Met Glu  
                                  1395                      1400                      1405  
 Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr Asn Val Arg Asn  
                                  1410                      1415                      1420  
 Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu Ile Tyr Lys Thr  
                                  1425                      1430                      1435                      1440  
 Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala Val Thr Ile Leu  
                                  1445                      1450                      1455  
 Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr Glu Phe Ser Ser  
                                  1460                      1465                      1470  
 Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly Leu Lys Lys Leu  
                                  1475                      1480                      1485  
 Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn Glu Ser Trp Lys

1490	1495	1500
Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe Ala Arg Ala Lys 1505	1510	1515 1520
Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro Ser Gln Phe Ile 1525	1530	1535
Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln Ile Phe Gly Val 1540	1545	1550
Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser Ser Asp Arg Pro 1555	1560	1565
Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala Ile Ile Ser Tyr 1570	1575	1580
Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro Pro Asn Pro Pro 1585	1590	1595 1600
Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile Thr Gly Ile Ser 1605	1610	1615
Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu Tyr Gln Gln Cys 1620	1625	1630
Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp Glu Ala Val Ser 1635	1640	1645
Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg Gly Asp Gly Leu 1650	1655	1660
Pro Lys Asp Thr Arg Ile Ser Asp Ser Leu Ala Pro Ile Gly Asn Trp 1665	1670	1675 1680
Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg Leu Asn Pro Phe 1685	1690	1695
Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val Asp Asn His Leu 1700	1705	1710
Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile Glu Trp Ile Asn 1715	1720	1725
Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met Leu Lys Ser Asp 1730	1735	1740
Leu His Glu Glu Asn Ser Trp Arg Asp 1745	1750	

<210> 52  
 <211> 2109  
 <212> PRT  
 <213> Vesicular stomatitis virus  
 <220>

<221> MOD\_RES

<222> (1)..(2109)

<223> "Xaa" represents any, other or unknown amino acid

<400> 52

Met Glu Val His Asp Phe Glu Thr Asp Glu Phe Asn Asp Phe Asn Glu  
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Asp Asp Tyr Ala Thr Arg Glu Phe Leu Asn Pro Asp Glu Arg Met Thr  
20 25 30  
Tyr Leu Asn His Ala Asp Tyr Asn Leu Asn Ser Pro Leu Ile Ser Asp  
35 40 45  
Asp Ile Asp Asn Leu Ile Arg Lys Phe Asn Ser Leu Pro Ile Pro Ser  
50 55 60  
Met Trp Asp Ser Lys Asn Trp Asp Gly Val Leu Glu Met Leu Thr Ser  
65 70 75 80  
Cys Gln Ala Asn Pro Ile Ser Thr Ser Gln Met His Lys Trp Met Gly  
85 90 95  
Ser Trp Leu Met Ser Asp Asn His Asp Ala Ser Gln Gly Tyr Ser Phe  
100 105 110  
Leu His Glu Val Asp Lys Glu Ala Glu Ile Thr Phe Asp Val Val Glu  
115 120 125  
Thr Phe Ile Arg Gly Trp Gly Asn Lys Pro Ile Glu Tyr Ile Lys Lys  
130 135 140  
Glu Arg Trp Thr Asp Ser Phe Lys Ile Leu Ala Tyr Leu Cys Gln Lys  
145 150 155 160  
Phe Leu Asp Leu His Lys Leu Thr Leu Ile Leu Asn Ala Val Ser Glu  
165 170 175  
Val Glu Leu Leu Asn Leu Ala Arg Thr Phe Lys Gly Lys Val Arg Arg  
180 185 190  
Ser Ser His Gly Thr Asn Ile Cys Arg Leu Arg Val Pro Ser Leu Gly  
195 200 205  
Pro Thr Phe Ile Ser Glu Gly Trp Ala Tyr Phe Lys Lys Leu Asp Ile  
210 215 220  
Leu Met Asp Arg Asn Phe Leu Leu Met Val Lys Asp Val Ile Ile Gly  
225 230 235 240  
Arg Met Gln Thr Val Leu Ser Met Val Cys Arg Ile Asp Asn Leu Phe  
245 250 255  
Ser Glu Gln Asp Ile Phe Ser Leu Leu Asn Ile Tyr Arg Ile Gly Asp  
260 265 270  
Lys Ile Val Glu Arg Gln Gly Asn Phe Ser Tyr Asp Leu Ile Lys Met



275	280	285
Val Glu Pro Ile Cys Asn Leu Arg Leu Met Lys Leu Ala Arg Glu Ser 290 295 300		
Arg Pro Leu Val Pro Gln Phe Pro His Phe Glu Asn His Ile Lys Thr 305 310 315 320		
Ser Val Asp Glu Gly Ala Lys Ile Asp Arg Gly Ile Arg Phe Leu His 325 330 335		
Asp Gln Ile Met Ser Val Lys Thr Val Asp Leu Thr Leu Val Ile Tyr 340 345 350		
Gly Ser Phe Arg His Trp Gly His Pro Phe Ile Asp Tyr Tyr Ala Gly 355 360 365		
Leu Glu Lys Leu His Ser Gln Val Thr Met Lys Lys Asp Ile Asp Val 370 375 380		
Ser Tyr Ala Lys Ala Leu Ala Ser Asp Leu Ala Arg Ile Val Leu Phe 385 390 395 400		
Gln Gln Phe Asn Asp His Lys Lys Trp Phe Val Asn Gly Asp Leu Leu 405 410 415		
Pro His Asp His Pro Phe Lys Ser His Val Lys Glu Asn Thr Trp Pro 420 425 430		
Thr Ala Ala Gln Val Gln Asp Phe Gly Asp Lys Trp His Glu Leu Pro 435 440 445		
Leu Ile Lys Cys Phe Glu Ile Pro Asp Leu Leu Asp Pro Ser Ile Ile 450 455 460		
Tyr Ser Asp Lys Ser His Ser Met Asn Arg Ser Glu Val Leu Lys His 465 470 475 480		
Val Arg Met Asn Pro Asn Thr Pro Ile Pro Ser Lys Lys Val Leu Gln 485 490 495		
Thr Met Leu Asp Thr Lys Ala Thr Asn Trp Lys Glu Phe Leu Lys Glu 500 505 510		
Ile Asp Glu Lys Gly Leu Asp Asp Asp Leu Ile Ile Gly Leu Lys 515 520 525		
Gly Lys Glu Arg Glu Leu Lys Leu Ala Gly Arg Phe Phe Ser Leu Met 530 535 540		
Ser Trp Lys Leu Arg Glu Tyr Phe Val Ile Thr Glu Tyr Leu Ile Lys 545 550 555 560		
Thr His Phe Val Pro Met Phe Lys Gly Leu Thr Met Ala Asp Asp Leu 565 570 575		
Thr Ala Val Ile Lys Lys Met Leu Asp Ser Ser Ser Gly Gln Gly Leu		



	580		585		590
.	Lys Ser Tyr Glu Ala Ile Cys	Ile Ala Asn His Ile Asp Tyr Glu Lys			
	595	600	605		
'	Trp Asn Asn His Gln Arg Lys	Leu Ser Asn Gly Pro Val Phe Arg Val			
	610	615	620		
	Met Gly Gln Phe Leu Gly Tyr Pro Ser Leu Ile Glu Arg Thr His Glu				
	625	630	635		640
	Phe Phe Glu Lys Ser Leu Ile Tyr Tyr Asn Gly Arg Pro Asp Leu Met				
		645	650		655
	Arg Val His Asn Asn Thr Leu Ile Asn Ser Thr Ser Gln Arg Val Cys				
		660	665		670
	Trp Gln Gly Gln Glu Gly Gly Leu Glu Gly Leu Arg Gln Lys Gly Trp				
		675	680		685
	Ser Ile Leu Asn Leu Leu Val Ile Gln Arg Glu Ala Lys Ile Arg Asn				
		690	695		700
	Thr Ala Val Lys Val Leu Ala Gln Gly Asp Asn Gln Val Ile Cys Thr				
	705	710	715		720
	Gln Tyr Lys Thr Lys Lys Ser Arg Asn Val Val Glu Leu Gln Gly Ala				
		725	730		735
	Leu Asn Gln Met Val Ser Asn Asn Glu Lys Ile Met Thr Ala Ile Lys				
		740	745		750
	Ile Gly Thr Gly Lys Leu Gly Leu Leu Ile Asn Asp Asp Glu Thr Met				
		755	760		765
	Gln Ser Ala Asp Tyr Leu Asn Tyr Gly Lys Ile Pro Ile Phe Arg Gly				
		770	775		780
	Val Ile Arg Gly Leu Glu Thr Lys Arg Trp Ser Arg Val Thr Cys Val				
	785	790	795		800
	Thr Asn Asp Gln Ile Pro Thr Cys Ala Asn Ile Met Ser Ser Val Ser				
		805	810		815
	Thr Asn Ala Leu Thr Val Ala His Phe Ala Glu Asn Pro Ile Asn Ala				
		820	825		830
	Met Ile Gln Tyr Asn Tyr Phe Gly Thr Phe Ala Arg Leu Leu Leu Met				
		835	840		845
	Met His Asp Pro Ala Leu Arg Gln Ser Leu Tyr Glu Val Gln Asp Lys				
		850	855		860
	Ile Pro Gly Leu His Ser Ser Thr Phe Lys Tyr Ala Met Leu Tyr Leu				
	865	870	875		880
	Asp Pro Ser Ile Gly Gly Val Ser Gly Met Ser Leu Ser Arg Phe Leu				

885								890								895													
Ile	Arg	Ala	Phe	Pro	Asp	Pro	Val	Thr	Glu	Ser	Leu	Ser	Phe	Trp	Arg														
900								905								910													
Phe	Ile	His	Val	His	Ala	Arg	Ser	Glu	His	Leu	Lys	Glu	Met	Ser	Ala														
915								920								925													
Val	Phe	Gly	Asn	Pro	Glu	Ile	Ala	Lys	Phe	Arg	Ile	Thr	His	Ile	Asp														
930								935								940													
Lys	Leu	Val	Glu	Asp	Pro	Thr	Ser	Leu	Asn	Ile	Ala	Met	Gly	Met	Ser														
945				950								955								960									
Pro	Ala	Asn	Leu	Leu	Lys	Thr	Glu	Val	Lys	Lys	Cys	Leu	Ile	Glu	Ser														
				965								970								975									
Arg	Gln	Thr	Ile	Arg	Asn	Gln	Val	Ile	Lys	Asp	Ala	Thr	Ile	Tyr	Leu														
				980								985								990									
Tyr	His	Glu	Glu	Asp	Arg	Leu	Arg	Ser	Phe	Leu	Trp	Ser	Ile	Asn	Pro														
995								1000								1005													
Leu	Phe	Pro	Arg	Phe	Leu	Ser	Glu	Phe	Lys	Ser	Gly	Thr	Phe	Leu	Gly														
1010								1015								1020													
Val	Ala	Asp	Gly	Leu	Ile	Ser	Leu	Phe	Gln	Asn	Ser	Arg	Thr	Ile	Arg														
				1030								1035								1040									
Asn	Ser	Phe	Lys	Lys	Lys	Tyr	His	Arg	Glu	Leu	Asp	Asp	Leu	Ile	Val														
				1045								1050								1055									
Arg	Ser	Glu	Val	Ser	Ser	Leu	Thr	His	Leu	Gly	Lys	Leu	His	Leu	Arg														
1060								1065								1070													
Arg	Gly	Ser	Cys	Lys	Met	Trp	Thr	Cys	Ser	Ala	Thr	His	Ala	Asp	Thr														
1075								1080								1085													
Leu	Arg	Tyr	Lys	Ser	Trp	Gly	Arg	Thr	Val	Ile	Gly	Thr	Thr	Val	Pro														
1090								1095								1100													
His	Pro	Leu	Glu	Met	Leu	Gly	Pro	Gln	His	Arg	Lys	Glu	Thr	Pro	Cys														
1105				1110								1115								1120									
Ala	Pro	Cys	Asn	Thr	Ser	Gly	Phe	Asn	Tyr	Val	Ser	Val	His	Cys	Pro														
				1125								1130								1135									
Asp	Gly	Ile	His	Asp	Val	Phe	Ser	Ser	Arg	Gly	Pro	Leu	Pro	Ala	Tyr														
1140								1145								1150													
Leu	Gly	Ser	Lys	Thr	Ser	Glu	Ser	Thr	Ser	Ile	Leu	Gln	Pro	Trp	Glu														
1155								1160								1165													
Arg	Glu	Ser	Lys	Val	Pro	Leu	Ile	Lys	Arg	Ala</																			



1185	1190	1195	1200
Leu Ser Asn Ile His Ser Leu Thr Gly Glu Glu Trp Thr Lys Arg Gln	1205	1210	1215
His Gly Phe Lys Arg Thr Gly Ser Ala Leu His Arg Phe Ser Thr Ser	1220	1225	1230
Arg Met Ser His Gly Gly Phe Ala Ser Gln Ser Thr Ala Ala Leu Thr	1235	1240	1245
Arg Leu Met Ala Thr Thr Asp Thr Met Arg Asp Leu Gly Asp Gln Asn	1250	1255	1260
Phe Asp Phe Leu Phe Xaa Ala Thr Leu Leu Tyr Ala Xaa Ile Thr Thr	1265	1270	1275
Thr Val Ala Arg Asp Gly Trp Ile Thr Ser Cys Thr Asp His Tyr His	1285	1290	1295
Ile Ala Cys Lys Ser Cys Leu Arg Pro Ile Glu Glu Ile Thr Leu Asp	1300	1305	1310
Ser Ser Met Asp Tyr Thr Pro Pro Asp Val Ser His Val Leu Lys Thr	1315	1320	1325
Trp Arg Asn Gly Glu Gly Ser Trp Gly Gln Glu Ile Lys Gln Ile Tyr	1330	1335	1340
Pro Leu Glu Gly Asn Trp Lys Asn Leu Ala Pro Ala Glu Gln Ser Tyr	1345	1350	1355
Gln Val Gly Arg Cys Ile Gly Phe Leu Tyr Gly Asp Leu Ala Tyr Arg	1365	1370	1375
Lys Ser Thr His Ala Glu Asp Ser Ser Leu Phe Pro Leu Ser Ile Gln	1380	1385	1390
Gly Arg Ile Arg Gly Arg Gly Phe Leu Lys Gly Leu Leu Asp Gly Leu	1395	1400	1405
Met Arg Ala Ser Cys Cys Gln Val Ile His Arg Arg Ser Leu Ala His	1410	1415	1420
Leu Lys Arg Pro Ala Asn Ala Val Tyr Gly Gly Leu Ile Tyr Leu Ile	1425	1430	1435
Asp Lys Leu Ser Val Ser Pro Pro Phe Leu Ser Leu Thr Arg Ser Gly	1445	1450	1455
Pro Ile Arg Asp Glu Leu Glu Thr Ile Pro His Lys Ile Pro Thr Ser	1460	1465	1470
Tyr Pro Thr Ser Asn Arg Asp Met Gly Val Ile Val Arg Asn Tyr Phe	1475	1480	1485
Lys Tyr Gln Cys Arg Leu Ile Glu Lys Gly Lys Tyr Arg Ser His Tyr			

1490	1495	1500
Ser Gln Leu Trp Leu Phe Ser Asp Val Leu Ser Ile Asp Phe Ile Gly 1505                      1510                      1515                      1520		
Pro Phe Ser Ile Ser Thr Thr Leu Leu Gln Ile Leu Tyr Lys Pro Phe 1525                      1530                      1535		
Leu Ser Gly Lys Asp Lys Asn Glu Leu Arg Glu Leu Ala Asn Leu Ser 1540                      1545                      1550		
Ser Leu Leu Arg Ser Gly Glu Gly Trp Glu Asp Ile His Val Lys Phe 1555                      1560                      1565		
Phe Thr Lys Asp Ile Leu Leu Cys Pro Glu Glu Ile Arg His Ala Cys 1570                      1575                      1580		
Lys Phe Gly Ile Ala Lys Asp Asn Asn Lys Asp Met Ser Tyr Pro Pro 1585                      1590                      1595                      1600		
Trp Gly Arg Glu Ser Arg Gly Thr Ile Thr Thr Ile Pro Val Tyr Tyr 1605                      1610                      1615		
Thr Thr Thr Pro Tyr Pro Lys Met Leu Glu Met Pro Pro Arg Ile Gln 1620                      1625                      1630		
Asn Pro Leu Leu Ser Gly Ile Arg Leu Gly Gln Leu Pro Thr Gly Ala 1635                      1640                      1645		
His Tyr Lys Ile Arg Ser Ile Leu His Gly Met Gly Ile His Tyr Arg 1650                      1655                      1660		
Asp Phe Leu Ser Cys Gly Asp Gly Ser Gly Gly Met Thr Ala Ala Leu 1665                      1670                      1675                      1680		
Leu Arg Glu Asn Val His Ser Arg Gly Ile Phe Asn Ser Leu Leu Glu 1685                      1690                      1695		
Leu Ser Gly Ser Val Met Arg Gly Ala Ser Pro Glu Pro Pro Ser Ala 1700                      1705                      1710		
Leu Glu Thr Leu Gly Gly Asp Lys Ser Arg Cys Val Asn Gly Glu Thr 1715                      1720                      1725		
Cys Trp Glu Tyr Pro Ser Asp Leu Cys Asp Pro Arg Thr Trp Asp Tyr 1730                      1735                      1740		
Phe Leu Arg Leu Lys Ala Gly Leu Gly Leu Gln Ile Asp Leu Ile Val 1745                      1750                      1755                      1760		
Met Asp Met Glu Val Arg Asp Ser Ser Thr Ser Leu Lys Ile Glu Thr 1765                      1770                      1775		
Asn Val Arg Asn Tyr Val His Arg Ile Leu Asp Glu Gln Gly Val Leu 1780                      1785                      1790		
Ile Tyr Lys Thr Tyr Gly Thr Tyr Ile Cys Glu Ser Glu Lys Asn Ala		

1795	1800	1805
Val Thr Ile Leu Gly Pro Met Phe Lys Thr Val Asp Leu Val Gln Thr 1810 1815 1820		
Glu Phe Ser Ser Ser Gln Thr Ser Glu Val Tyr Met Val Cys Lys Gly 1825 1830 1835 1840		
Leu Lys Lys Leu Ile Asp Glu Pro Asn Pro Asp Trp Ser Ser Ile Asn 1845 1850 1855		
Glu Ser Trp Lys Asn Leu Tyr Ala Phe Gln Ser Ser Glu Gln Glu Phe 1860 1865 1870		
Ala Arg Ala Lys Lys Val Ser Thr Tyr Phe Thr Leu Thr Gly Ile Pro 1875 1880 1885		
Ser Gln Phe Ile Pro Asp Pro Phe Val Asn Ile Glu Thr Met Leu Gln 1890 1895 1900		
Ile Phe Gly Val Pro Thr Gly Val Ser His Ala Ala Ala Leu Lys Ser 1905 1910 1915 1920		
Ser Asp Arg Pro Ala Asp Leu Leu Thr Ile Ser Leu Phe Tyr Met Ala 1925 1930 1935		
Ile Ile Ser Tyr Tyr Asn Ile Asn His Ile Arg Val Gly Pro Ile Pro 1940 1945 1950		
Pro Asn Pro Pro Ser Asp Gly Ile Ala Gln Asn Val Gly Ile Ala Ile 1955 1960 1965		
Thr Gly Ile Ser Phe Trp Leu Ser Leu Met Glu Lys Asp Ile Pro Leu 1970 1975 1980		
Tyr Gln Gln Cys Leu Ala Val Ile Gln Gln Ser Phe Pro Ile Arg Trp 1985 1990 1995 2000		
Glu Ala Val Ser Val Lys Gly Gly Tyr Lys Gln Lys Trp Ser Thr Arg 2005 2010 2015		
Gly Asp Gly Leu Pro Lys Asp Thr Arg Ile Ser Asp Ser Leu Ala Pro 2020 2025 2030		
Ile Gly Asn Trp Ile Arg Ser Leu Glu Leu Val Arg Asn Gln Val Arg 2035 2040 2045		
Leu Asn Pro Phe Asn Glu Ile Leu Phe Asn Gln Leu Cys Arg Thr Val 2050 2055 2060		
Asp Asn His Leu Lys Trp Ser Asn Leu Arg Lys Asn Thr Gly Met Ile 2065 2070 2075 2080		
Glu Trp Ile Asn Arg Arg Ile Ser Lys Glu Asp Arg Ser Ile Leu Met 2085 2090 2095		
Leu Lys Ser Asp Leu His Glu Glu Asn Ser Trp Arg Asp		



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